

Five new species of the genus *Heliozela* Herrich-Schäffer (Lepidoptera, Heliozelidae) from Japan

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Abstract Five new species of the genus *Heliozela* Herrich-Schäffer, 1853, *H. glabrata* sp. nov., *H. brevitalea* sp. nov., *H. limbata* sp. nov., *H. biprominens* sp. nov., and *H. angulata* sp. nov., are described with illustrations from Japan, while only two species of the genus, *H. subpurpurea* Meyrick, 1941 and *H. castaneella* Kuroko, 1982, were previously recorded. These species strongly resemble each other in the wing-pattern, but they are distinguishable mainly by the male genitalia.

Key words New species, *Heliozela*, Heliozelidae, Lepidoptera, Japan.

Introduction

The genus *Heliozela* Herrich-Schäffer, 1853 belongs to the family Heliozelidae, containing about 30 species throughout the world. In Japan, only two species of the genus were recorded by Meyrick (1934) and Kuroko (1982). Among them, *H. subpurpurea* Meyrick was recorded from Nagasaki Prefecture, but the larvae and host-plant of this species are not known. Another species, *H. castaneella* Kuroko (Fig. 1F) was recorded from Honshu and Kyushu, and the larvae are known as a leaf miner of the chestnut tree, *Castanea crenata* (Fagaceae) (Kuroko, 1982).

In the genus *Heliozela*, it is very difficult to distinguish species on the basis of external characters because the pattern of the forewing is simple and very similar between species in having only white dorsal spots on a dark gray ground color.

Recently we collected many adults of the genus *Heliozela* in coppices of *Quercus* spp. (Fagaceae) in Nagano, Nara, Osaka and Wakayama Prefectures. Their wing patterns are very similar, but we found five new species among them mainly by the characteristics of the male genitalia. Terminology follows Razowski and Wojtusiak (1978) and Kuroko (1982, 1987). All type series are deposited in the Entomological Laboratory, Osaka Prefecture University, Sakai.

Heliozela glabrata sp. nov. (Figs 1A, 2)

Adult (Fig. 1A). Forewing 2.9 mm, including cilia. Frons smooth, golden fuscous with brassy reflections; vertex dark gray. Antenna length 0.5 times forewing, covered with blackish fuscous scales, scape and pedicel pale fuscous. Maxillary palpus dark gray. Labial palpus fuscous. Thorax pale gray with brassy reflections. Legs fuscous with pale brown; fore femur fuscous with brassy reflections; middle tibia covered with long scales, dorso-basal part with thorn-like scales; middle tarsus pale brown ventrally; hind tibia with whitish silver laterally; with long hairs behind medial spurs. Forewing grayish ochreous with

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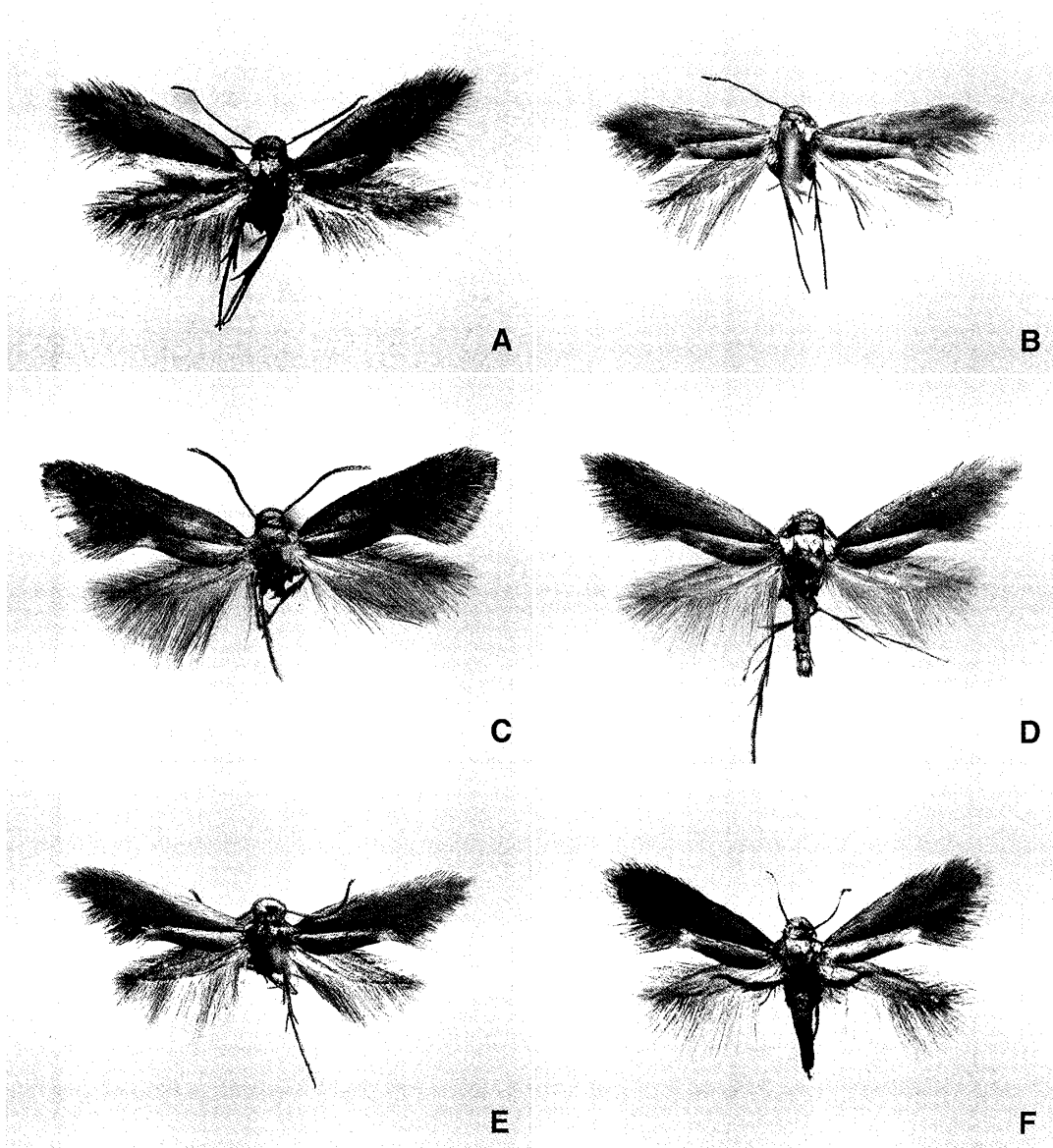


Fig. 1. Adults of Japanese *Heliozela* spp. A. *H. glabrata* sp. nov., holotype ♂. B. *H. brevitalea* sp. nov., holotype ♂. C. *H. limbata* sp. nov., holotype ♂. D. *H. biprominens* sp. nov., holotype ♂. E. *H. angulata* sp. nov., holotype ♂. F. *H. castaneella* Kuroko, ♂.

brassy reflections, two whitish brown spots on dorsum, inner spot at 1/5, very small, outer spot at 1/2, quadrangular; lower costal base without long hairs; cilia pale brown. Hindwing dark gray with metallic reflections; cilia pale brown.

Male genitalia (Fig. 2). Uncus indistinct. Tegumen well sclerotized, dorso-anterior part protruding. Vinculum moderate, about 1.5 times as long as valva, posterior margin slightly protruded at middle. Valva sub-triangular to oblong, with a long projection, parallel-sided; pecten moderately developed, with 10 spines. Transtilla well sclerotized; apodeme short, less than 0.2 times as long as vinculum. Aedeagus nearly straight, about same length with vinculum, thick apically. Manica with several thorns. Juxta arrow-shaped.

Holotype ♂, Osaka Prefecture: Mt Izumi-Katsuragi, 11. V. 2002, T. Hirowatari, B.W. Lee,

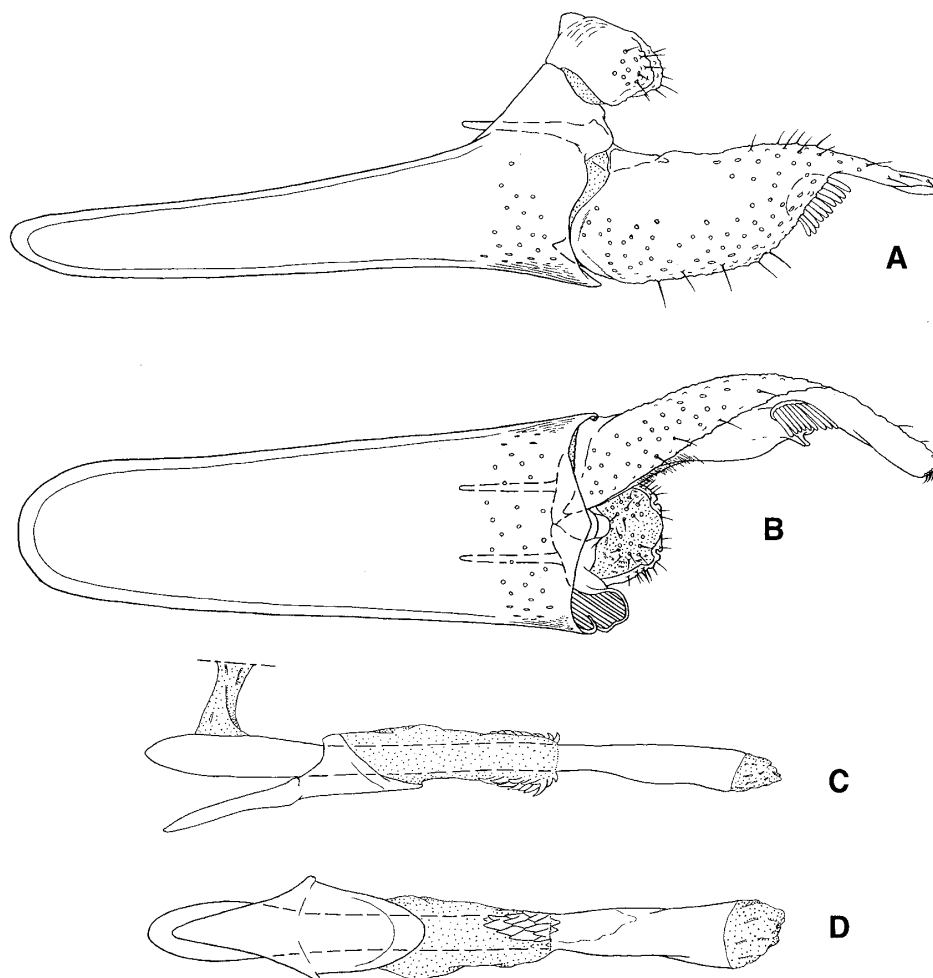


Fig. 2. Male genitalia of *Heliozela glabrata* sp. nov., holotype. A. Whole genitalia except aedeagus, lateral view. B. *Ditto*, ventral view. C. Aedeagus, lateral view. D. *Ditto*, ventral view.

H. Mizukawa, genitalia slide no. OPULBW 148.

Distribution. Honshu (Osaka Prefecture).

Etymology. From the Latin *glabrata* (=without hairs), referring to the costal base of forewing not having long hairs.

Remarks. This species is distinguished from other Japanese *Heliozela* species by not having long hairs on the lower costal part of the forewing. In the shape of the valva, this species is similar to *H. castaneella* Kukoko and *H. brevitalea* sp. nov. But, these two species are different from this species in having a pointed process at the apical tip of the aedeagus. Only one specimen of this species was collected in Mt Izumi-Katsuragi, Osaka Prefecture.

***Heliozela brevitalea* sp. nov.** (Figs 1B, 3)

Adult (Fig. 1B). Forewing 2.8–3.2 mm (holotype 2.9 mm, including cilia). Frons smooth, bronzy-fuscous with brassy reflections; vertex blackish fuscous. Antenna length 0.4–0.5 times forewing, covered with dark gray scales, apical half with tufty scales; scape with pale

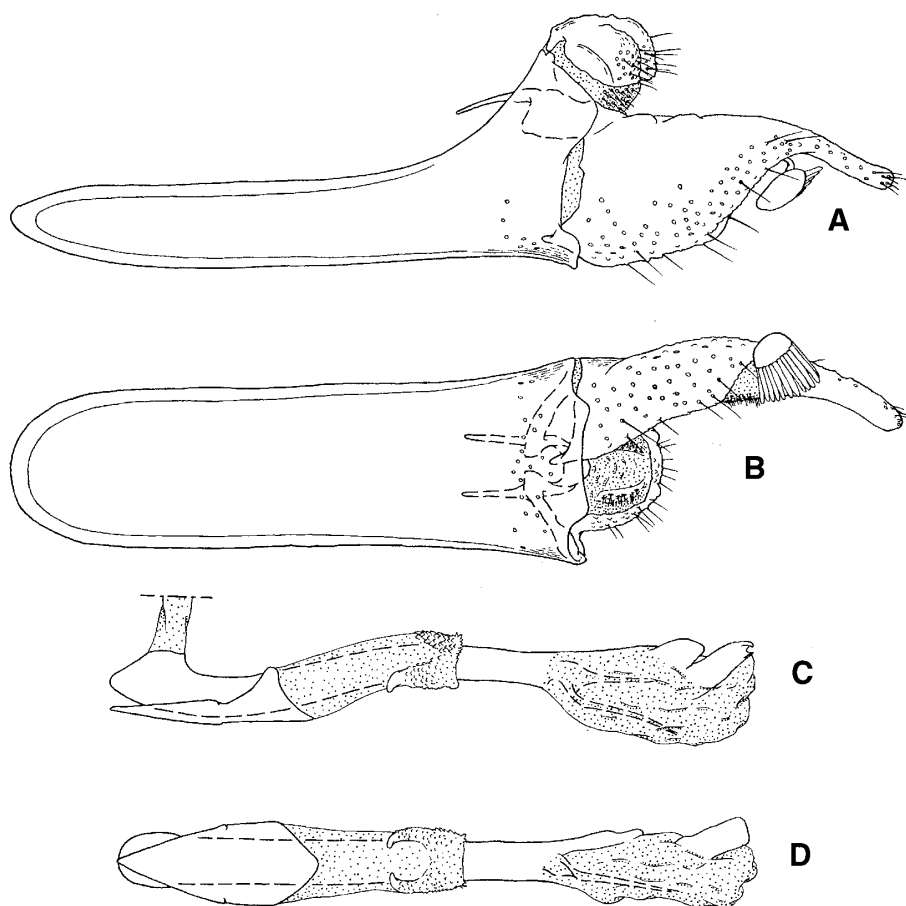


Fig. 3. Male genitalia of *Heliozela brevitalea* sp. nov., holotype. A. Whole genitalia except aedeagus, lateral view. B. *Ditto*, ventral view. C. Aedeagus, lateral view. D. *Ditto*, ventral view.

brown. Maxillary palpus pale brown. Labial palpus pale brown. Thorax dark fuscous with metallic reflections, bright brown laterally. Legs blackish fuscous with pale brown; middle femur pale brown; middle tibia with thorn-like scales dorso-basally, pale brown ventrally; middle tarsus with purple reflections; hind tibia pale brown with long hairs behind medial spurs. Forewing grayish ochreous with brassy reflections, triangular spot pale yellowish-white with metallic reflections at 1/2; lower costal base with long hairs; cilia bronzy-fuscous. Hindwing pale brown with brassy reflections; cilia pale brown.

Male genitalia (Fig. 3). Uncus indistinct, each side slightly protruded. Tegumen well sclerotized, lateral part hollowed. Vinculum moderate, about 1.4 times as long as valva, posterior margin trapezoidal at middle. Valva subtriangular with blunt projection; pecten moderately developed, with 12 spines. Transtilla well sclerotized; apodeme short, less than 0.2 times as long as vinculum. Aedeagus slightly curved at the middle, almost same length as vinculum, posterior part with two long spine-like processes ventrally and two lamellae dorsally. Manica with a pair of curved digitate processes and many minute spines. Juxta triangular on apical half.

Holotype ♂, Nagano Prefecture: Kamikijima, Kijimadaira-mura, 18. V. 2001, T. Hirowatari, B.W. Lee, H. Mizukawa, genitalia slide no. OPULBW 151, wing slide no. OPULBW 181. Paratypes. Nagano Pref.: 1 ♂, same locality and collectors as holotype, 30. IV. 2002, genitalia slide no. 160; Osaka Pref.: 1 ♂, Kubo, Kumatori-cho, 13. IV. 2002, T. Hirowatari,

B.W. Lee, H. Mizukawa, genitalia slide no. OPULBW 163; 1 ♂, Nagase, Kaizuka-shi, 10. IV. 2003, R. Matsumoto, H. Yamamoto, Y. Sawada, genitalia slide no. OPULBW 141.

Distribution. Honshu (Nagano and Osaka Prefectures).

Etymology. From the Latin *brevis* (=short) combined with *talea* (=rod, stick), referring to the relatively short apodeme of the transtilla of the male genitalia.

Remarks. This species is similar to *H. angulata* sp. nov. and *H. castaneella* Kuroko, but is distinguished from them by the transtilla with a short apodeme, the apical part of the aedeagus with two spine-like processes and the manica with a pair of digitate processes.

***Heliozela limbata* sp. nov.** (Figs 1C, 4, 5)

Adult (Fig. 1C). Forewing 3.4–3.9 mm (holotype: 3.5mm, including cilia). Frons smooth, golden fuscous with brassy reflections; vertex bronzy-fuscous; frons and area behind eyes with whitish yellow scales. Antenna length 0.5–0.6 times forewing, covered with blackish fuscous scales; scape pale brown ventrally; flagellum ventral part pale brown. Maxillary palpus whitish yellow. Labial palpus pale fuscous, apical part dark gray. Thorax blackish fuscous with metallic reflections, brown laterally. Legs blackish fuscous with pale brown; fore femur brown basally; fore tibia pale brown ventrally; fore tarsus pale brown ventrally; middle femur brown dorsally; middle tibia dorso-basally with thorn-like scales, ventral part paler than dorsal part; middle tarsus pale brown on basal half on each tarsomere; hind femur pale brown dorsally; hind tibia pale brown with long hairs behind medial spurs; each spur blackish fuscous outside, pale brown inside; hind tarsus fuscous on basal half of each tarsomere. Forewing blackish fuscous with brassy reflections, two pale yellowish-white spots on dorsum, inner spot at 1/5, very small, outer small spot at 1/2, triangular; lower costal base with long hairs; cilia bronzy-fuscous. Hindwing brown with brassy reflections; cilia brown.

Male genitalia (Fig. 4). Uncus slightly protruding. Tegumen well sclerotized. Vinculum long, slender, about 2 times as long as valva, posterior margin emarginate at middle. Valva quadrate to oval with a long spatulate projection, ventral part with a hairy knob; pecten moderately developed with 13 spines. Transtilla well sclerotized; apodeme short, about 0.2 times as long as vinculum. Aedeagus slightly curved dorsally at middle, slightly longer than vinculum, basal tip forming a ginkgo leaf. Manica with a pair of large thorns and many small spines. Juxta arrow-shaped.

Female genitalia (Fig. 5). Ninth tergite weakly sclerotized, triangular-shaped, tapering terminally. Apophyses slender, anterior part slightly swollen. Apex of ovipositor dorso-ventrally flattened, with several small teeth. Vestibulum long, middle part thin, with sclerotized plate, posterior part cylindrical, weakly sclerotized ventrally, anterior part bell-shaped, with two thorns, well sclerotized. Corpus bursae ellipsoidal without signum.

Holotype ♂, Osaka Prefecture: Mt Izumi-Katsuragi, 28. IV. 2003, B.W. Lee, genitalia slide no. OPULBW 145. Paratypes. Nagano Pref.: 2 ♂ 15 ♀, Kamikijima, Kijimadaira-mura, 18. V. 2001, T. Hirowatari, B.W. Lee, M. Mizukawa, genitalia slide no. OPULBW 003, 005; 4 ♂ 1 ♀, 30. IV. 2002, genitalia slide no. OPULBW 142, 157, 161, 3 ♀, 1. V. 2002, 1 ♂ 11 ♀, 2. V. 2002, same locality and collectors, genitalia slide no. OPULBW 004, 159; 1 ♂ 1 ♀, same locality, 3, 22. V. 2003, B.W. Lee; same locality; 1 ♀, Kayanodaira alt. 700 m, Kijimadaira-mura, 2. V. 2002, T. Hirowatari, B.W. Lee, H. Mizukawa; Nara Pref.: 3 ♂ 9 ♀, Obakodake, Totsukawa-mura, 6. V. 2002, B.W. Lee, genitalia slide no. OPULBW 077, 078, 174, 175, head slide no. OPULBW 119, wing slide no. OPULBW 087; Osaka Pref.: 1 ♀,

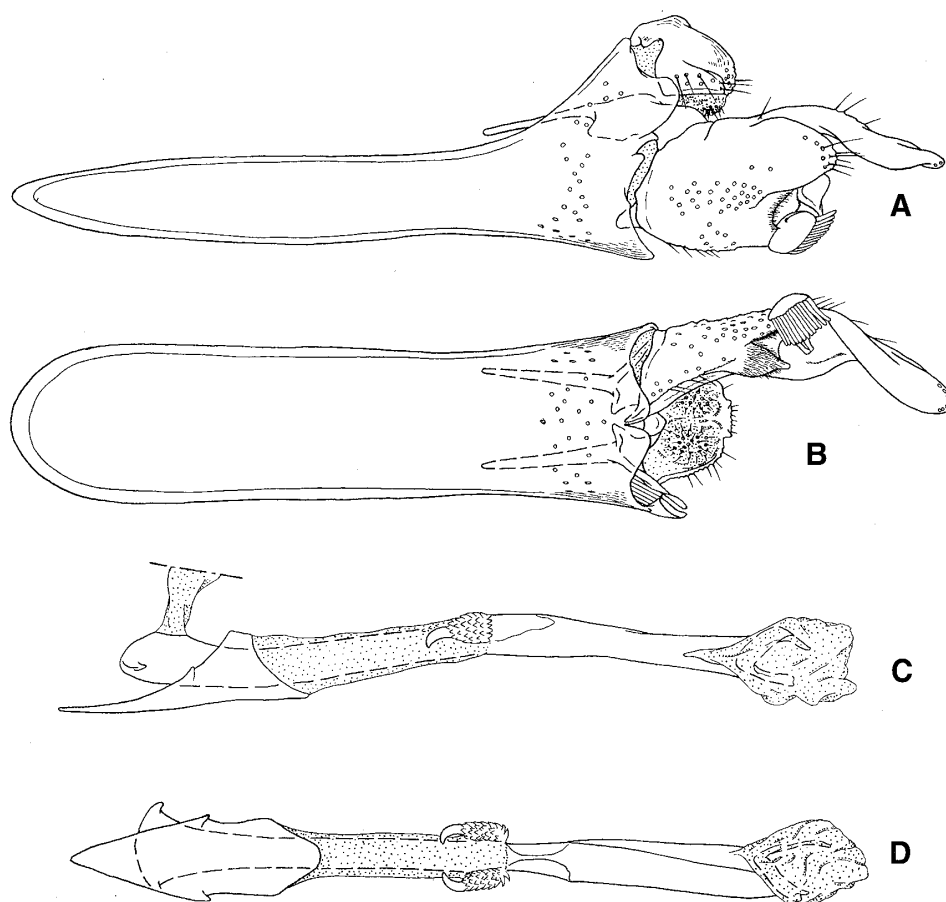


Fig. 4. Male genitalia of *Heliozela limbata* sp. nov., holotype. A. Whole genitalia except aedeagus, lateral view. B. *Ditto*, ventral view. C. Aedeagus, lateral view. D. *Ditto*, ventral view.

same locality as holotype, 6. V. 1999, H. Okamoto; 1 ♂ 7 ♀, same locality, 10. V. 2001, T. Hirowatari, B.W. Lee, genitalia slide no. OPULBW 009, 010, 172, 173; 5 ♂ 2 ♀, same data as holotype, genitalia slide no. OPULBW 149; 1 ♀, same locality, 28. IV. 2002, T. Hirowatari; 10 ♀, Sobura, Kaizuka-shi, 13. IV. 2002, T. Hirowatari, B.W. Lee, H. Mizukawa; 1 ♂ 1 ♀, Kubo, Kumatori-cho, 13. IV. 2002, T. Hirowatari, B.W. Lee, M. Mizukawa, genitalia slide no. OPULBW 162, 164; 2 ♂, Nagase, Kaizuka-shi, 10. IV. 2003, R. Matsumoto, H. Yamamoto, Y. Sawada; Wakayama Pref.: 24 ♂ 11 ♀, Mt Izumi-Katsuragi, 27. IV. 2002, T. Hirowatari, B.W. Lee, genitalia slide no. OPULBW 147, 154, 176, 177, 146, wing slide no. OPULBW 178, 182. Nagasaki Pref.: 11 ♂ 4 ♀, Izumi, Kamitsushima-cho, Tsushima Is., 28. III. 2002, U. Jinbo.

Distribution. Honshu (Nagano, Nara, Osaka and Wakayama Prefectures) and Kyushu (Nagasaki Pref.: Tsushima Is.).

Etymology. From the Latin *limbus* (=band) referring to the bands on tarsus of legs.

Remarks. This species is distinguished from other Japanese *Heliozela* species by the blackish fuscous wing color, the tarsus with bands especially on the middle leg, the long vinculum, the unique shaped valva, and the manica which has a pair of large thorns and many small spines.

Adults of this species were collected in spring. Some of them were flying around the young

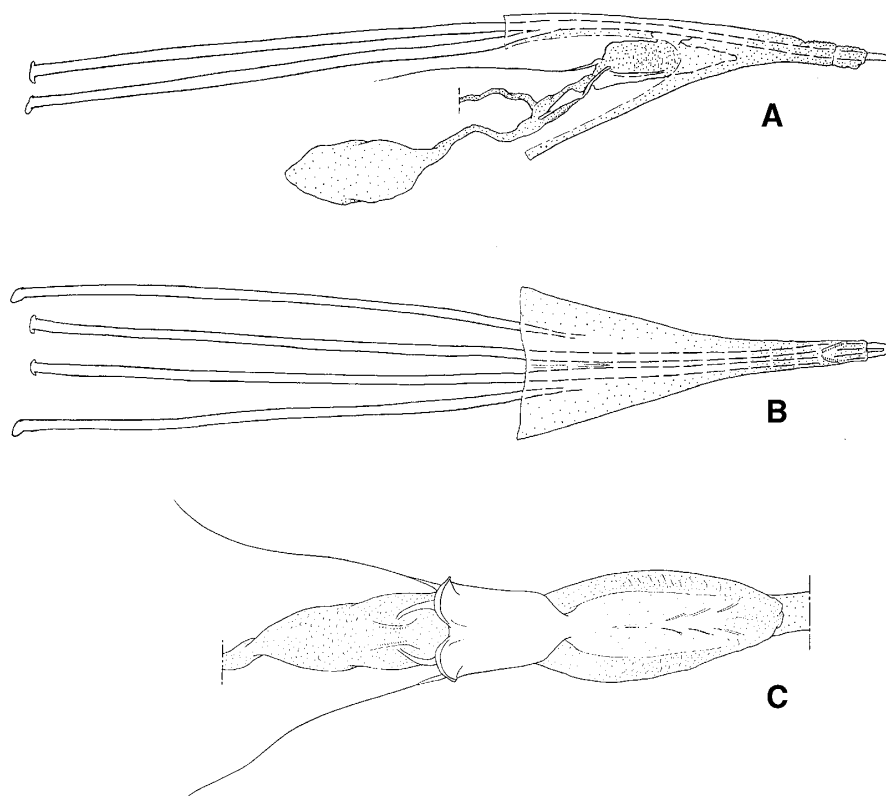


Fig. 5. Female genitalia of *Heliozela limbata* sp. nov., paratype. A. Terminalia, lateral view. B. Ditto, ventral view. C. Vestibulum, ventral view.

leaves of *Quercus serrata* (Fagaceae). In Nagano Pref., we found some larvae mining in the young leaves of *Q. serrata*. Though we failed to get the adults by rearing, the behavior displayed by many adults which were flying near *Q. serrata* and the discovery of larvae of *Heliozela* indicate that the host plant of this species may be *Q. serrata*.

***Heliozela biprominens* sp. nov.** (Figs 1D, 6)

Adult (Fig. 1D). Forewing 2.7–3.3 mm (holotype 3.2 mm, including cilia). Frons smooth, bright silver with brassy reflections; vertex pale gray. Antenna length 0.4–0.5 times forewing, pale gray, scape bright silver ventrally; flagellum ventral part pale brown. Maxillary palpus whitish silver. Labial palpus bright silver. Thorax pale gray with brassy reflections, whitish silver with brassy reflections laterally. Legs pale gray with brassy reflections; fore tibia and tarsus fuscous dorsally, bright silver ventrally; middle femur whitish silver; middle tibia dorso-basally with thorn-like scales; hind femur bright silver; hind tibia pale gray with long hairs behind medial spurs; each spur dark gray outside, bright silver inside. Forewing pale grayish ochreous with brassy reflections, a very small yellowish-white dorsal spot at 1/2; lower costal base with long hairs; cilia pale brown. Hindwing pale gray with brassy reflections; cilia pale brown.

Male genitalia (Fig. 6). Uncus represented by two small warts. Tegumen well sclerotized, lateral part deeply hollowed. Vinculum long, slender, about 1.8 times as long as valva, posterior margin hollowed at middle. Valva sub-triangular to quadrate, with long spatulate projection, costal margin concave, lateral part slightly constricted, blunted, inner middle part protruded; pecten moderately developed with 15–17 spines. Transtilla well sclerotized;

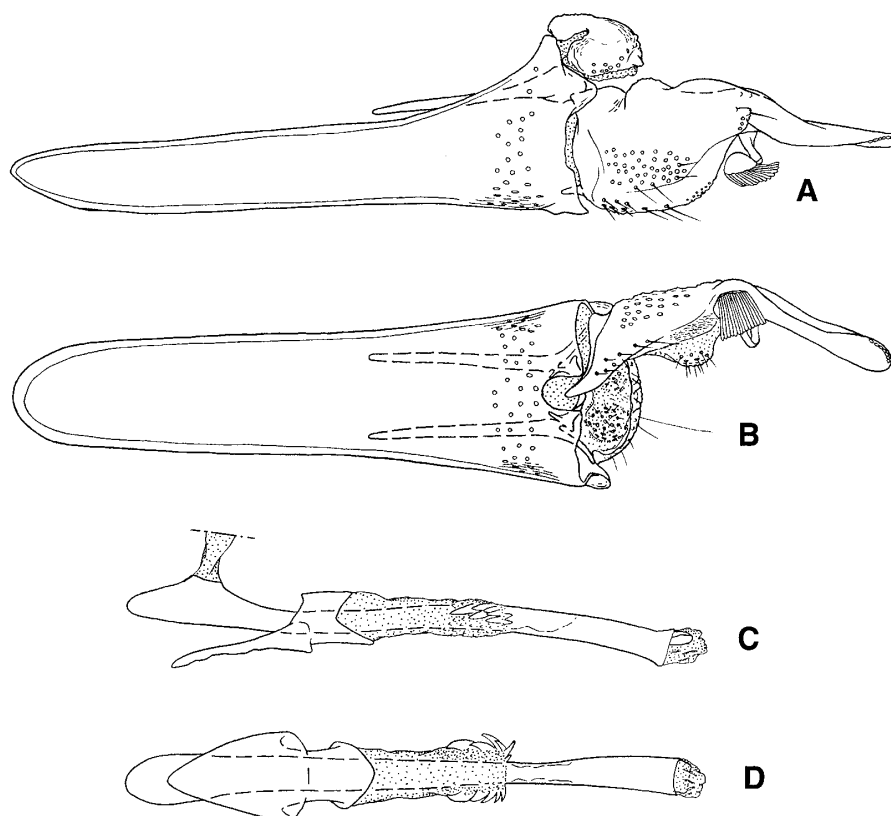


Fig. 6. Male genitalia of *Heliozela biprominens* sp. nov., holotype. A. Whole genitalia except aedeagus, lateral view. B. *Ditto*, ventral view. C. Aedeagus, lateral view. D. *Ditto*, ventral view.

apodeme long, about 0.4 times as long as vinculum. Aedeagus nearly straight, almost same length as vinculum. Manica with several large thorns. Juxta arrow-shaped, middle part narrow.

Holotype ♂, Osaka Prefecture: Mt Izumi-Katsuragi, 29. IV. 2003, B.W. Lee, genitalia slide no. OPULBW 144. Paratypes. Nagano Pref.: 1 ♂, Kamikijima, Kijimadaira-mura, 30. IV. 2002, T. Hirowatari, B.W. Lee, H. Mizukawa, genitalia slide no. OPULBW 158; 1 ♂, same locality, 1. V. 2002, T. Hirowatari, B.W. Lee, H. Mizukawa, genitalia slide no. OPULBW 155, wing slide no. OPULBW 179; Nara Pref.: 4 ♂, Obakodake, Totsukawa-mura, 2. V. 2002, B.W. Lee, genitalia slide no. OPULBW 167, 168, 170, 171.

Distribution. Honshu (Nagano, Nara and Osaka Prefectures).

Etymology. From the Latin *bi* (=two) combined with *prominens* (=projection), referring to two projections on the uncus of the male genitalia.

Remarks. This species is distinguished from other Japanese *Heliozela* species by the dark gray wing color, one small dorsal spot on the forewing, the two small projections on the uncus, the long apodeme of the transtilla, and the several large thorns on the manica.

***Heliozela angulata* sp. nov.** (Figs 1E, 7)

Adult (Fig. 1E). Forewing 2.7–3.4 mm (holotype 2.7mm, including cilia). Frons smooth, silver with brassy reflections; vertex golden fuscous. Antenna length 0.5–0.6 times

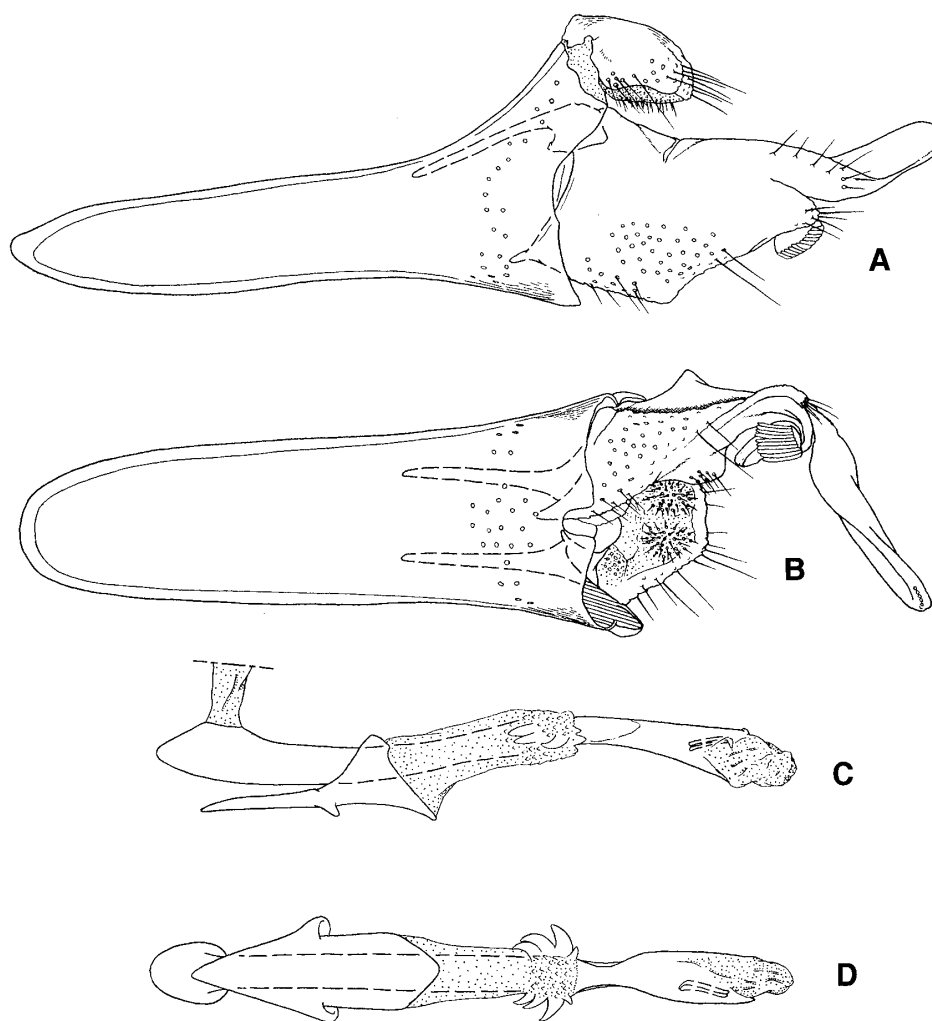


Fig. 7. Male genitalia of *Heliozela angulata* sp. nov., holotype. A. Whole genitalia except aedeagus, lateral view. B. *Ditto*, ventral view. C. Aedeagus, lateral view. D. *Ditto*, ventral view.

forewing, covered with dark gray scales, scape and pedicel pale brown. Maxillary palpus whitish silver. Labial palpus gray, inner surface silver. Thorax blackish fuscous with metallic reflections, bright silver laterally. Legs fuscous with metallic reflections; fore femur bright silver ventrally; middle tibia dorso-basally with thorn-like scales; middle tarsus pale brown ventrally; hind tibia whitish silver laterally; with long hairs behind medial spurs. Forewing grayish ochreous with brassy reflections, two white spots on dorsum, inner spot at $1/5$, very small, irregular-shaped, outer spot at $1/2$, small, triangular; lower costal base with long hairs; cilia dark fuscous with metallic reflection. Hindwing dark gray with metallic reflections; cilia pale brown.

Male genitalia (Fig. 7). Uncus indistinct. Tegumen well sclerotized, lateral part deeply hollowed. Vinculum moderate, about 1.5 times as long as valva, posterior margin hollowed at middle. Valva trapezoidal to quadrate, with very long spatulate projection, strongly curved inwardly, lateral part distinct with blunt end, costal part angulated, distinctly protruded laterally; pecten moderately developed with 10–11 spines. Transtilla well sclerotized; apodeme somewhat thick, about 0.3 times as long as vinculum. Aedeagus slightly sinuate dorso-ventrally, same length as vinculum, constricted at posterior $1/4$. Manica with

three pairs of large horns and many minute spines. Juxta arrow-shaped, posterior half narrow.

Holotype ♂, Nagano Prefecture: Kamikijima, Kijimadaira-mura, 1. V. 2002, T. Hirowatari, B.W. Lee, H. Mizukawa, genitalia slide no. OPULBW 150, wing slide no. OPULBW 180. Paratype. Nara Pref.: 1 ♂, Obakodake, Totsukawa-mura, 6. V. 2002, B.W. Lee, genitalia slide no. OPULBW 166.

Distribution. Honshu (Nagano and Nara Prefectures).

Etymology. From the Latin *angulatus* (=angular) referring to the laterally angulated costal part of valva of the male genitalia.

Remarks. This species is similar to *Heliozela glabrata* sp. nov., but is distinguished from it by the relatively large trapezoidal to quadrate valva, laterally angulated costal part of the valva, and the strongly curved projection of the valva.

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 ———, 1987. Three new species of the genus *Antispila* (Lepidoptera: Heliozelidae). In Sugi, S. (Ed.), Collection of papers presented to celebrate Prof. Hiroshi Inoue's seventieth birthday. *Tinea* 12 (Suppl.): 109–117.
 Meyrick, E., 1934. Heliozelidae. *Exotic Microlepid.* 4: 466.
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摘 要

日本産 *Heliozela* 属 (鱗翅目, ツヤコガ科) の 5 新種 (李 峰雨・広渡俊哉・黒子 浩)

Heliozela 属は日本から 2 種が知られている (Meyrick, 1934; Kuroko, 1982) が, 本属の成虫は前翅の斑紋が単純 (後縁部に三角形の小斑紋をもつだけ) で種の区別が難しい。

著者らは, 近年長野県, 奈良県, 大阪府などで採集した標本を検討した結果, 外観は類似しているが交尾器の形態によって識別できる 5 新種を認めた。本稿では 5 種の成虫および交尾器を図示・記載した。いずれも, コナラ属の樹木がある雑木林で採集したが, 寄主植物については明らかではない。

1. *Heliozela glabrata* sp. nov. カツラギツヤコガ (新称) (Figs 1A, 2)

前翅長 2.9 mm (ホロタイプ)。前翅は青銅光沢がある灰褐色で後縁部に 2 つの斑紋をもち, 雄交尾器のバルバは楕円形。本種は他の種より, 前翅前縁基部の腹面の長毛をもたないことで他の種と区別できる。本種は大阪府の和泉葛城山で採集された。

2. *Heliozela brevitalea* sp. nov. トビイロツヤコガ (新称) (Figs 1B, 3)

前翅長 2.8–3.2 mm (ホロタイプ: 2.9 mm). 前翅は青銅光沢がある灰褐色で後縁部に1つの斑紋をもつ. 雄交尾器のトランスティラの突起が非常に短い, エデアグスの先端部に2つの針状の突起をもつ, マニカに1対の指状突起をもつことから他の種と区別できる. 本種は長野県, 大阪府で採集された.

3. *Heliozela limbata* sp. nov. アシオビツヤコガ (新称) (Figs 1C, 4, 5)

前翅長 3.4–3.9 mm (ホロタイプ: 3.5 mm). 前翅は青銅光沢がある暗褐色で後縁部に2つの斑紋をもつ. 本種は他の種と比べ, 翅の色が濃く, 脚の附節に帯状の斑紋があることで区別できる. 本種は長野県, 奈良県, 大阪府, 和歌山県, 長崎県で採集された.

4. *Heliozela biprominens* sp. nov. ウストビツヤコガ (新称) (Figs 1D, 6)

前翅長 2.7–3.3 mm (ホロタイプ: 3.2 mm). 前翅は青銅光沢がある淡灰褐色で後縁部に1つの小三角斑をもつ. 雄交尾器のウックスに2つの小突起をもつ, トランスティラの突起が長い, マニカにある複数の大きいとげで他の種と区別できる. 本種は長野県, 奈良県, 大阪府で採集された.

5. *Heliozela angulata* sp. nov. ミヤマツヤコガ (新称) (Figs 1E, 7)

前翅長 2.7–3.4 mm (ホロタイプ: 2.7 mm). 前翅は青銅光沢がある灰褐色で後縁部に2つの斑紋をもつ. 雄交尾器のバルバの前縁部が側方に張り出す, バルバ先端部が長く内方に大きく曲がる, トランスティラの突起が比較的太いことから他の種と区別できる. 本種は長野県, 奈良県で採集された.

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